

1.2 Inductive Reasoning

Scientists and mathematicians look for patterns and try to draw conclusions from them.

A conjecture is an unproven statement that is based on a pattern or observation.

Looking for patterns and making conjectures is part of a process called inductive reasoning.

Three stages of reasoning:

1. Look for a pattern
2. Make a conjecture
3. Verify the conjecture

Example 1: Complete the conjecture.

A. The sum of any two odd numbers is ____.

B. The product of any two odd numbers is ____.

C. The sum of the first n odd positive integers is ____.

Just because something is true for several examples does not prove that it is true in general.

To prove a conjecture is true, you need to prove it is true in ALL cases.

A conjecture is considered false if it is not always true.

To prove a conjecture is false, you need to find only one counterexample.

A counterexample is an example that shows a conjecture is false.

Example 2: Show the conjecture is false by finding a counterexample.

A. The sum of two numbers is always greater than the larger of the two numbers.

B. All shapes with four sides the same length are squares.

C. If the product of two numbers is even, the numbers must be even.

D. If a shape has two sides the same length, it must be a rectangle.